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ABSTRACT

This study examines the role of interlanguage transfer in lexico-semantic development in adult native Japanese-speaking learners of English as a second language in reference to two questions: (1) what constrains the initial hypothesis the student makes about the new target language word? and (2) what constrains a restructuring process of a potentially non-normative hypothesis? A semantic transfer hypothesis that predicts language transfer to be both pervasive and persistent in the domain of second language lexico-semantics is proposed, and it is suggested that this process operates together with the specific exemplar condition (stating that in second language learning, the student picks up and uses certain specific exemplars of a word, phrase, or sentence) and the prototype condition interactively in a total process of lexico-semantic development in this population. Implications are also drawn about the developmental relationship of over- and under-extensions. (MSE)

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CONDITIONS ON INTERLINGUAL SEMANTIC TRANSFER

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Introduction

In this study, we are concerned with interlingual semantic transfer, an L1-dependent psycholinguistic factor operative in second language (L2) lexico-semantic development. The concept of language transfer well captures the general tendency that L2 learners use what they know about their first language (L1) when approaching the task of learning another language (see Lado 1957, Stockwell and Bowen 1965, Jacobovits 1970, Taylor 1975, Kellerman 1977, 1979, Schachter 1983, Eckman 1977, Zobl 1980). Today, most research on language transfer concentrates on investigating the conditions under which language transfer commonly occurs or does not occur.

In general, our study deals with the conditions of transferability. For this purpose, we feel it important to take a limited-domain approach to the general phenomenon of language transfer for two related reasons. First, the subject matter is very complex. It seems that none of the available theories adequately account for all aspects of language transfer, no matter how broadly they stretch their formulations. The assumptions we make about syntactic transfer, for example, may or may not hold true in the case of semantic transfer. Second, by restricting the scope of investigation, we may be able to study the domain selected more thoroughly than before. Needless to say, each limited domain theory must be eventually incorporated into an integrative theory of language transfer.

The domain selected for this study is lexico-semantic development in adult second language learners. Any inquiry into the domain involves two fundamental

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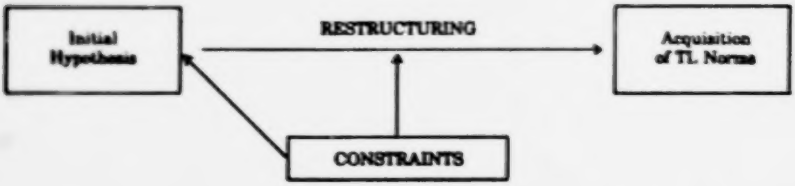
questions: (1) what constrains the initial hypothesis the student makes about a new target language (TL) word? (2) what constrains a restructuring process of a potentially non-normative hypothesis? The student must somehow assign meaning to a lexical form, and if the representation of the lexical meaning is incomplete or erroneous, then the student must restructure his hypothesis until he gains the native speaker's sensitivity to the meaning potential of the lexical item in question. The process of acquiring the meaning potential of a lexical item can be schematically expressed as follows:

FIGURE 1
A Process of Acquiring the Meaning Potential of a Lexical Item



We assume that interlingual semantic mapping (ISM) is operative in L2 lexico-semantic development; in a cognitive sense, the student maps what he knows about objects, events, and relations in L1 onto L2 lexico-semantics. The ISM has two components: (i) the *search-translation-equivalent* (STE) strategy and (ii) the *search-collocation–equivalent* (SCE) strategy. With the STE strategy, the learner attaches meaning to a newly perceived L2 item by searching for an L1-translation equivalent, while with the SCE strategy the learner transfers the range of the L1-word usage to the use of the L2 word. The unconstrained form of the SCE can be stated as follows: given the "W1 = W2", which is formulated through the STE strategy, the learner tends to transfer whatever possible in W1 (i.e., the L1 word perceived by the student as the translation equivalent of an L2 word, W2) to the use of W2.

Both the STE and SCE strategies are mechanisms for the mapping of L2 words onto pre-existing L1 concepts. We assume that ISM operates in lexico-semantic development as long as there exists a gap between what the learner wants to say and what he can actually say in the TL. On the basis of this assumption, we predict that language transfer is both pervasive and persistent in the domain of L2 lexico-semantics. We call this hypothesis the *Semantic Transfer Hypothesis* (STH) (Tanaka 1983, Abe and Tanaka 1983, Takahashi 1984). Though it remains for future research to determine exactly how pervasive and persistent semantic transfer is, we have some evidence in favor of the STH. Takahashi (1984), for example, asked 300 Japanese students to complete English sentences paired with their Japanese translations. The test items included the following:

(1) A. My sister doesn't think she is pretty because her nose is (short).
B. I'm not asking you if you can (ride) a motorcycle, but if you have one.

For item (1A), the Japanese version uses *hikui*, which is most strongly associated

with English *low* from the Japanese student's point of view (Tanaka 1983). However, the use of *low* here is not acceptable; *short* is the normative adjective collocating with the item *nose*. Similarly, for item (1B), the Japanese version, which was given to the students in Takahashi's (1984) study, uses the verb *untensuru*, which is most strongly associated with English *drive; to drive a motorcycle* is not collocatively normative in English.

If the STH is valid, we then expect that Japanese ESL students show a strong tendency for using *low* and *drive* to complete items A and B, respectively. The following results were obtained from Takahashi's (1984) study:

TABLE 1
Incorrect use of drive for ride by 300 Japanese students

Level of Proficiency	DRIVE	Others
I (N = 100)	93(93%)	7(7%)
II (N = 97)*	75(77%)	22(23%)
III (N = 100)	75(75%)	25(25%)

*3 avoidance (Three gave no response to the item)

TABLE 2
Incorrect use of low for short by 300 Japanese students

Level of Proficiency	LOW	Others
I (N = 79)*	61(77%)	18(23%)
II (N = 78)**	65(83%)	13(17%)
III (N = 98)***	73(75%)	25(25%)

*11 avoidance **12 avoidance *** 2 avoidance

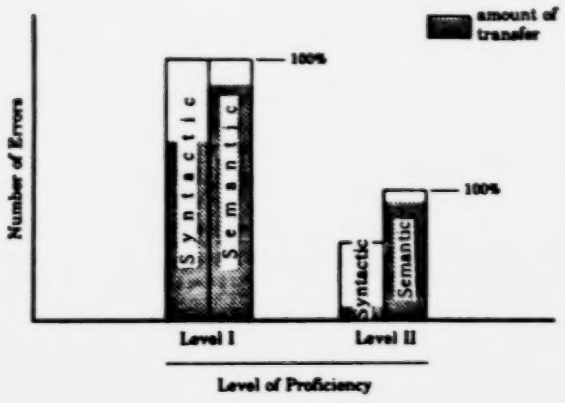
While the level of proficiency seems to have some effect on semantic transferability, Tables 1 and 2 provide fairly strong evidence for the claim that language transfer is both pervasive and persistent in lexico-semantic development. Tanaka (1983) provides further evidence for the STH in relation to the acquisition of English locatives by Japanese students. For example, consider the following test item:

(2) John is walking _____ the direction of the station.
(a) in (b) to (c) for (d) at (e) on

Of the 60 college students in Japan who responded to this item, 50 made incorrect responses; 46 (92%) chose *to*, which is an instance of semantic transfer motivated by the Japanese locative *e* [+direction, +goal]. Fifty-nine Japanese students, who were attending some American secondary school in New York, responded to item (2). Of the 59, 39 (66%) made incorrect responses; 36 out of 39 (92%) chose the locative *to*. In comparison with the acquisition-poor group,

the acquisition-rich group made significantly fewer errors ($\chi^2(1) = 13.98$, $p. < .001$). However, in terms of the proportion of semantic transfer and non-transfer errors, there was no significant difference between the two groups ($\chi^2(1) = 0.546$, NS). This suggests the possibility that the STH holds true regardless of learning contexts, though the number of transfer errors quantitatively decreases with increasing L2 proficiency. Figure 2 illustrates what we are suggesting here: the proportion of errors related to semantic transfer remains constant irrespective of level of proficiency, although the numbers of errors decreases with increased proficiency. This is basically the empirical claim made by the STH.

FIGURE 2
Level of Proficiency and Amount of Language Transfer

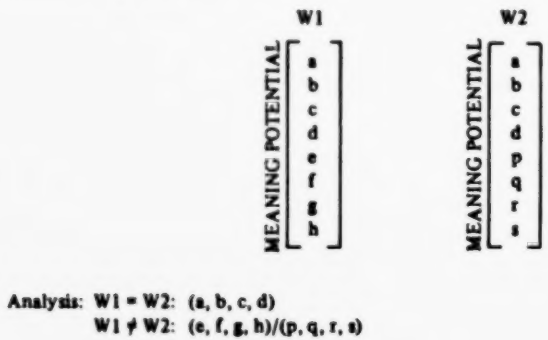


Conditions on the Semantic Transfer Hypothesis

We know that the STH is too strong to capture the L2 learner's linguistic behavior adequately, especially in a developmental sense. There are at least two important phenomena to be explained within a framework of lexico-semantic development: (i) *overextensions* and (ii) *underextensions*. In the case of overextensions (see Bloom 1973, Clark and Clark 1977), the student inappropriately applies a lexical item to a broader set of contexts than possible in the target language. In contrast, underextensions result when the student applies a lexical item to a narrower set of contexts than possible in the target language. In this case, one cannot assume that the student is able to use a word appropriately in different contexts simply because he uses the word correctly in one situation. (The STH throws no light on underextensions.)

Both over- and underextensions depend on the student's knowledge and the situational context where a given item is used. On the basis of his experience with a set of occurrences of a lexical item, W2, the student formulates an *item-specific hypothesis about W2 (i.e., W1 = W2)* by means of the STE strategy. The hypothesis W1 = W2 means that W2 is the most strongly associated with W1 in the student's semantic schemata. Yet, *occurrence-specific* analysis of W1 and W2 reveals that the meaning potential of W1 does not always accord with that of W1. For example, consider the hypothetical interlingual analysis of W1 and W2 in Figure 3:

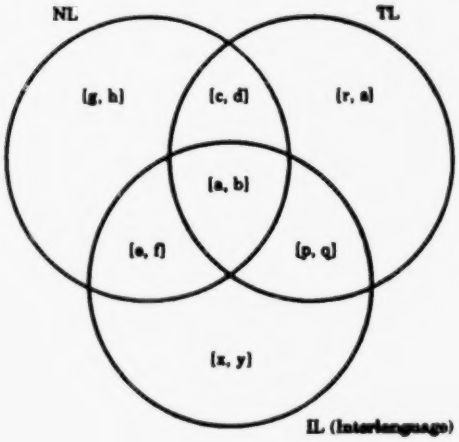
Figure 3
Hypothetical interlingual analysis of W1 and W2 in terms of their meaning potential


Item-Specific Level:
Hypothesis: W1=W2
Occurrence-Specific Level:
W1
W2
MEANING POTENTIAL
a b c d e f g h
MEANING POTENTIAL
a b c d p q r s
Analysis: W1 = W2: (a, b, c, d)
W1 ≠ W2: (e, f, g, h)/(p, q, r, s)

If ISM operates unconditionally, we predict that the student uses the word W2 wherever W1 is used. In other words, he uses W2 in the context of (a, b, c, d, e, f, g, h) the use of W2 in (a, b, c, d) results in *positive transfer*, while the use of W2 in (e, f, g, h) results in *negative transfer*. Here, positive and negative transfer correspond to correct extensions and overextensions respectively.

However, this theory of semantic transfer has two major flaws. First, it does not account for the use of W2 in the context of (p, q, r, s). Second, it fails to account for the underextension phenomenon; students use the L1 knowledge only selectively when learning a second language (Kellerman 1979, Tanaka 1983). Figure 4 illustrates a more realistic picture of the student's behavior in second language.

FIGURE 4
Interlanguage Phenomena to be Explained within a Theory of Lexico-semantic Development



In Figure 4, the domain (c, d) represents no occurrence of positive transfer (see Kellerman 1979). The domain (g, h) represents no occurrence of negative transfer. Overextensions are observed in the domains (e, f) and (x, y); overextensions in (e, f) are motivated by negative transfer, while overextensions in (x, y), by what may be called "lexical creativity" (Clark 1983). Underextensions are observed in (c, d) and (r, s), where the domain (c, d) is related to language transfer, and the domain (r, s) to some L1-independent process. Thus, the phenomena to be explained within a theory of lexico-semantic development include the following questions: (1) Why is it that positive transfer occurs in the domain (a, b), not in (c, d)? (2) Why is it that negative transfer occurs in the domain (e, f), not in (g, h)? (3) Why is it that the student picks up the domain (p, q), instead of (r, s)?

In the following sections, we propose that *prototypicality* and *specific-exemplariness* are the conditions that elicit over- and underextensions, and help explain developmental patterns of appearance and disappearance of those phenomena.

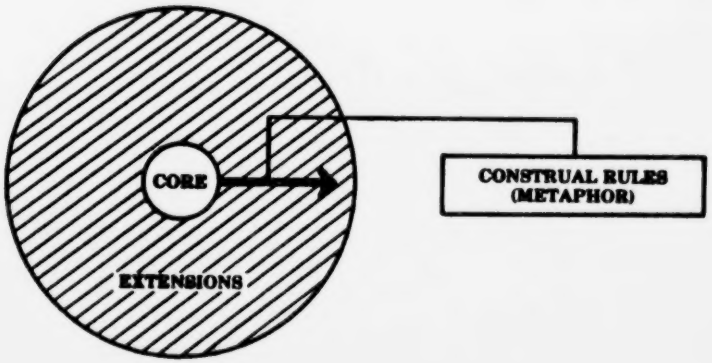
The Prototype Condition

The notion of *prototype* was originally proposed by Rosch (1973) as a means of explaining the internal structure of semantic and perceptual categories, and later, applied to a theory of semantic development in children (see Anglin 1977, Clark 1977, Nelson 1977). Each lexical item or category has an nth number of

occurrences or exemplars. There are central or good exemplars (prototypes), and poor, non-prototypical exemplars. Thus, prototypes represent the most typical member of a given category. Take the category *fruit*, for example. Most of us will agree that apples and oranges are good exemplars, while figs and olives are poor exemplars of fruit (Armstrong, Gleitman, and Gleitman 1983).

Rosch thinks that the internal structure of a category is "composed of a 'core meaning' which consists of the 'clearest cases' (best examples) of the category, 'surrounded' by other category members of decreasing similarity to that core meaning" (1973: 112). Along the same line, we may argue that each lexical item has a core or central meaning (i.e., prototype), and there are some kinds of "construal rules that govern the ways [the] core sense can be extended to provide other senses"(Miller 1978: 102). Thus, the internal structure of a lexical item looks like the following:

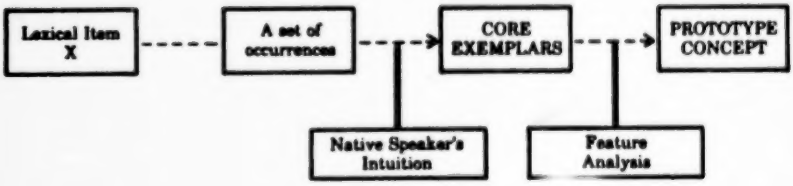
FIGURE 5
The Internal Structure of a Lexical Item



How do we identify core senses, then? Procedurally, we provide native speakers with a set of occurrences of a lexical item and ask them to rank order the occurrences in terms of prototypicality. The native speakers will be able to distinguish core exemplars from non-core exemplars in a probabilistic sense (see Kellerman 1979), although a fine analysis is difficult to make. As shown in Figure 6, the feature analysis of core exemplars should, in principle, identify certain salient semantic features which, we assume, characterize the prototype concept of the lexical item in question.

FIGURE 6

Procedures to Determine the Core (Prototype) Concept of a Lexical Item



While these procedures are probabilistic and highly subjective in nature, it is important to note that we are primarily concerned with how native speakers think of the coreness of a given item, not with a [illegible]antic analysis of the item in question. For example, given the following set:

(3) (a) Two parallel *lines* never meet.
(b) They were arrested at the state *line*.
(c) Please *line* up the block.
(d) What *line* of work are you at?
(e) Could you read over the actor's *lines*?

Hatch says that "most people tend to choose the first example as the most core meaning for line, then the second, and so on" (1983: 70-71). The core meaning or prototype concept of *line* seems to include "something one dimensional connecting two points" (Miller 1978: 101).

There are, however, at least two problems with this approach. First, while it may be empirically easy to distinguish core exemplars from non-core exemplars, it is difficult to rank order non-core exemplars in terms of prototypicality because of the "fuzzy" nature of non-core boundaries. Second, we must somehow find a way to characterize the mechanism that relates the core sense to non-core senses. The first problem requires a theory of markedness that distinguishes more than two levels; the second problem, a theory of metaphor (see Lakoff and Johnson 1980). Admitting that our argument remains incomplete as long as these two problems remain unsolved, we nevertheless consider the relationship between transferability and prototypicality, a relationship that presumably deals with the domains (a, b), (c, d), (e, f), and (g, h) in Figure 4.

Kellerman (1979) suggests three constraints on language transfer: (1) the learner's perception of the typological distance between L1 and L2, (2) the learner's perception of markedness of a potentially transferable item in his L1, and (3) the learner's knowledge of the L2. While Kellerman suggests that these three are interrelated, constraint (2) is most relevant to our on-going discussion. Concisely, it says: the more marked is an item, the less transferable the item is. For example, Kellerman had Dutch students of English sort 17 cards with sentences using Dutch *breken* (break), and asked them to judge whether or not Dutch *breken* in each sentence is transferable to English. Kellerman found a negative correlation between transferability and relative degree of coreness/markedness. In general,

"marked forms will be potentially less transferable than unmarked ones," where "markedness is a blanket term subsuming such features as frequence, productiveness, semantic transparency, coreness, etc." (1979: 53).

We asked 70 college students learning English in Japan to make acceptability judgements about the two sentences below:

(4) A. John *borrowed* the book from Bill.
B. John *borrowed* the idea from Bill.

Japanese *kariru* ('borrow') is used in both cases. However, the 70 students' responses were as follows:

TABLE 3
70 Japanese college students' responses to two English sentences using *borrow* in terms of acceptability

Sentence	ACCEPT	REJECT
BOOK	61 (87%)	9 (13%)
IDEA	21 (30%)	49 (70%)

The results in Table 3 accord with Kellerman's suggestion: the student accepted a prototypical occurrence of *borrow* much more strongly than an extended use of *borrow*. (Here we may note that markedness and prototypicality are almost synonymous, although the phenomenon of markedness can be explored on purely formal, linguistic grounds (Birwisch 1967), while the phenomenon of prototypicality requires empirical research dealing with how people think of a given category [or item].)

Following Kellerman's (1979) transfer theory we may predict that idiomatic expressions are resistant, by and large, to language transfer because students tend to feel that their L1 idioms are language-specific. We asked 88 Japanese college students to judge whether or not the following interlingual equivalents were valid:

(4) (a) E: When they were young, they *made many babies*. (made→had)
J: wakakata toki, karera wa takusan *kodomo o tsukutta*.

(b) E: His father is a *one corner person*. (one corner→respectful)
J: kare no chichi wa *hitokado no jinbutsu* da.

(c) E: I have *thrown a spoon to* that boy. (thrown a spoon to→given up on)
J: sono ko niwa *saji o nageta*

(d) E: I'm always *pulling his legs* when he has to study. (pulling his legs →bothering)
J: kare ga benkyoo o shinakutewa naranai toki itsu mo watashi ga *ashi o hippattsiru*.

The students were also asked to rank the Japanese sentences in terms of idiomaticity. The results are given in Table 4:

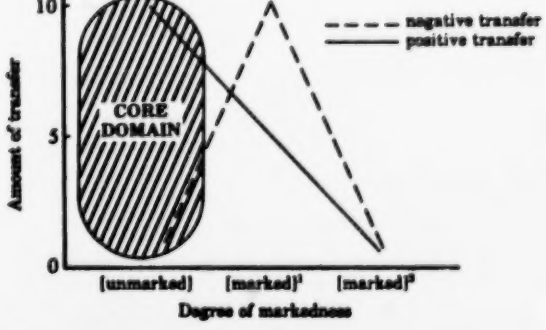
TABLE 4
Idiomaticity and acceptability of incorrect English sentences by Japanese college students (N = 88)

Items	ACCEPT	REJECT	Idiomaticity ranking
a	35 (40%)	53 (60%)	4
b	13 (15%)	75 (85%)	1
c	19 (22%)	69 (78%)	2
d	29 (33%)	59 (67%)	3

The Japanese ESL students judged that (b) and (c) were intuitively more idiomatic than (a) and (d). The results are generally interpretable within the framework suggested by Kellerman (1979): semantic transparency or idiomaticity seems to have something to do with the results. It is important here to note that Kellerman's experiment dealt with positive transfer i.e., the domains (a, b) and (c, d), whereas our informal study was concerned with negative transfer i.e., the domains (e, f) and (g, h). On the basis of Kellerman's and our studies, we might argue that transferability negatively correlates with markedness, irrespective of the valence (±) of language transfer. However, this view is faulty.

Tanaka suggested that "the effect of positive transfer decreases with increasing markedness, and yet, the effect of negative transfer is weak with unmarked/prototype items, gradually becoming stronger with increasing markedness up to a certain point, from which it becomes weaker again" (1983: 106), as illustrated in Figure 7.

FIGURE 7
A Hypothetical Relation between Degree of Markedness and Transferability



Negative transfer is weak in the core domain for two reasons: (1) no marked variation tends to be found in the core domain from a cross-linguistic point of view, and (2) even if some cross-linguistic variation is observed at the linguistic level, the core still remains the same at the conceptual level. The first reason will be captured in what we call the *prototype hypothesis:* if languages A and B have a category X, then the core concept of X is the same. This predicts a strong tendency for language-universals in the core domain (Berlin and Kay 1969, Rosch 1973). The second reason suggests that prototype items are relatively easier than extended items even when negative transfer is operating in both cases.

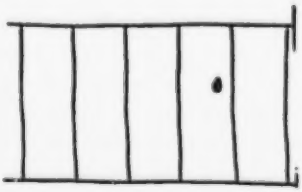
Let us assume that the prototype concept of the locative *in* includes the semantic feature [+a three-dimensional container with physical boundaries]. The Japanese locative ***naka-ni*** ('in') has same prototype concept. With this in mind, consider the four pictures below:

(5)

There's plenty of coffee ___ the pot.

John's driving ___ heavy fog.

John lives ___ a new brick house.



There's a hole ___ the wall.

In the spatial relation *X in Y*, the item using Y is considered a prototype case if the Y is characterized as a three-dimensional container with physical boundaries. Thus, the POT and HOUSE items are prototypical in terms of the use of *in*, while the WALL and FOG items are extended. However, at the linguistic level, the realization of the core concept varies from language to language. Take the HOUSE item, for example. In the context ***John wa ringazukuri no ie ( ) sundeiru***, Japanese ***naka-ni*** is very unlikely to be used; the locative ***ni***, which corresponds to English *at*, is normatively used. The STH predicts that Japanese ESL students use *at* instead of *in*, thus saying "John lives at a new brick house." However, the prototype condition suggests that it will be perceptually easy for

Japanese students to correctly determine the spatial relation of *John* and *a brick house*, despite a potential 'trap' of an interlingual gap (i.e., in ≠ ni).

A total of 284 Japanese college students were randomly assigned to one of the four groups; each group (N = 71) did one of the four items in (5). The results are shown in Table 5.

TABLE 5
A summary data of the Japanese students' responses to the POT, HOUSE, FOG, and WALL items

Items	IN	Others
POT [positive transfer, prototype] (N = 71]	60 (84.5%)	11 (15.5%)
HOUSE [negative transfer, prototype] (N = 71)	53 (74.6%)	18 (25.4%)
FOG [positive transfer, extended] (N = 71)	46 (64.8%)	25 (35.2%)
WALL [negative transfer, extended] (N = 71)	17 (23.9%)	54 (76.1%)

We may compare HOUSE with WALL with respect to the use of *in*. The significant difference (X^2 (1) = 36.52, p. < .001) is due to prototypicality because the Japanese subject's responses to both items can be constrained by negative transfer. Also, compare the POT item with the FOG item; positive transfer can operate in both cases. However, we obtained the correct response *in* more often for the POT item than for the FOG item (X^2 (1) = 7.28, p. < .01). The explanation involves prototypicality: the FOG item is more extended than the POT item in terms of the use of the locative *in*. Thus, the results show that negative transfer is relatively weak with prototype/unmarked items; prototypicality seems to be a condition that maximizes or minimizes the free operation of semantic transfer. Returning to Figure 4, prototypicality seems to be operative in the domain (c, d) which represents the underextension phenomenon. Likewise, the prototype condition seems to throw light on the question of why negative transfer does not occur in the domain (g, h).

The Specific Exemplar Condition

The STH constrained by the prototype condition still leaves a lot to be desired. In the Kellerman's (1979) study, his subjects judged *to break one's leg* and *to break one's heart* equally transferable. With respect to the use of *break*, we would intuitively say that *to break one's heart* is more extended or idiomatic than the prototypical expression *to break one's leg*. According to Kellerman (1979), both expressions are "core" examples of the use of *break*, though *heart* is more abstract than *leg*. His subjects judged both expressions equally transferable; hence, it seems that concreteness is not "crucial in decisions to transfer" (Kellerman 1979: 52) and what is crucial is, according to Kellerman, coreness. However, the problem is this. On the one hand, idiomatic expressions tend not to be interlingually trans-

ferred. On the other hand, a core exemplar like *break one's heart*, which is an idiomatic expression in a sense, is transferable as easily as a core exemplar like *break one's leg*.

We suggest that a theory of lexico-semantic development is incomplete to the extent that it ignores the specific exemplar condition. It is possible that Kellerman's subjects were familiar with the expression *break one's heart* as well as *break one's leg*. At this point, consider the Kellerman's (1979) data which show the rank order of 17 uses of Dutch *breken* in terms of transferability:

TABLE 6
Kellerman's (1979) data: the rank order of 17 uses of Dutch *breken* from most transferable to least transferable

Use	%	Use	%
leg	81%	ice	33%
heart	79%	ceasefire	28%
cup	64%	light rays	25%
man	61%	resistance	22%
word	60%	fall	17%
record	51%	voice	17%
oath	47%	afternoon	11%
waves	35%	strike	9%
law	34%		

Kellerman reports that "this rank order correlates *poorly* with the 'concrete-abstract' rank order (Spearman's p = .129, n.s.) and *very well* with the 'coreness' order (p = .837, significant at .0005)" (1979:51). However, we do not have a satisfactory definition of "coreness." Kellerman admits, "I cannot at this stage offer any linguistic or other a priori means of determining the 'coreness' of an item, but the ordering of meanings above seems intuitively acceptable" (1979:50). It is difficult to intuitively distinguish *break one's heart* from *break one's record*, even though Kellerman suggests, "frequency may be a crucial, if presently untestable, factor here" (1979: 50).

It seems more likely to say that both *break one's heart* and *break one's record* are relatively extended in comparison with the prototypical use of *break* such as *break one's cup* and *break one's leg*. The differences between *break one's heart* and *break one's record*, and between *break one's cup* and *break one's leg*, in Table 6 with respect to transferability are presumably a function of the student's experience or familiarity with such expressions. We will capture this point in terms of the Specific Exemplar Condition.

Let us note that no transfer theory throws light on the domains (p, q) and (r, s) in Figure 4. Neither does any transfer theory explain why Dutch students felt that *break* (leg) is more transferable than *break* (cup), though both seem equally good candidates for core exemplars. To clarify this point, consider the following illustrative occurrences of an item X:

(6) Item X: [A, B, C, D] transferable core exemplars [E, F, G, H] transferable non-core exemplars

In (6), it is quite possible that even among the transferable core exemplars [A, B, C, D], students transfer only A and D, not B and C. In the same vein, among the transferable non-core exemplars, students may transfer G and H, not E and F. Notice that the STH constrained by the prototype condition predicts that students transfer the core exemplars [A, B, C, D], and do not transfer the extended exemplars [E, F, G, H].

To provide some evidence for the former possibility, we asked 135 Japanese college students to judge whether or not the following "core exemplars" of *make* are acceptable in English:

(7) A. Nancy *makes* a doll for June.
B. Nancy *makes* cake for June.
C. Nancy *makes* a bookcase for June.

Table 7 summarizes the results:

TABLE 7
A summary data for the MAKE items responded by 135 Japanese college students

Item	ACCEPT	REJECT
DOLL	119 (88.1%)	16 (11.9%)
CAKE	113 (83.7%)	22 (16.3%)
BOOKCASE	79 (58.5%)	56 (41.5%)

Notice that we are unable to claim that *make* (bookcase) is less core than the other two in terms of the use of *make*. Nevertheless, our subjects rejected *make* (bookcase) more strongly than *make* (doll) and *make* (cake). What is suggested here is that the ESL student's use of a given lexical item tends to be restricted to specific contexts.

In order to pursue the problem of underextensions, we did a more controlled study. Consider the deictic verbs *bring* and *take*, contrasted with their Japanese equivalents below:

(8)

English	*Japanese*
BRING [± animate]	tsuretekuru [+animate]
	mottekuru [−animate]
TAKE [± animate]	tsureteiku [+animate]
	motteiku [−animate

The distinction between the Japanese items in each is determined by the distinguishing feature of the X word in *bring/take* (X) (this has been suggested by Tomoko Takahashi [personal communication]). In English, *bring* and *take* are used both for animate and for inanimate things, as follows:

(9) (a) When you visit us, please *bring* a bottle of wine with you.

(b) When you visit us next time, why don't you *bring* your children with you?

(c) When you go to New York next time, please *take* me there with you.

(d) When you go out tonight, don't forget to *take* an umbrella with you.

In order to investigate whether or not Japanese ESL students use *bring* and *take* similarly, we randomly assigned 60 college students to one of the four groups: (1) *bring* [−animate], (2) *bring* [+animate], (3) *take* [−animate], and (4) *take* [+animate]. Each *bring* and *take* was deleted from the sentences in (9); the student's task was to complete the sentence so as to fit the context specified by the Japanese translation. The results are shown in table 8.

Table 8
A summary data of the BRING and TAKE study

	BRING	TAKE
Animate	6/15 (40%)	13/15 (86.7%)
Inanimate	14/15 (93.3%)	12/15 (80%)

In the case of *take*, the subjects seem to be familiar with *take* (X [+animate]) as well as *take* (X [−animate]), while most subjects are familiar with the exemplar *bring* (X [−animate]), not with *bring* (X [+animate]). The results in Table 8 suggest that the student's knowledge about a given lexical item is restricted to particular cases.

The Specific Exemplar Condition states that in learning a second language the student picks up certain specific exemplars of X, where X is a word, a phrase, or a sentence, and behaves on the basis of the chosen specific exemplars (see Tanaka 1983, Kawade 1984b). The operating principle here is that the student

sticks to a particular familiar use(s) of X; the student does not take a risk of being wrong. As a result, language transfer does not occur where we expect it to occur. The Specific Exemplar Condition also explains why the student uses a given item in the domain (p, q), but not in the domain (r, s).

The Specific Exemplar Condition thus accounts for the phenomenon of underextension, and the problem of non-transfer. However, there is a subtle way the Specific Exemplar Condition relates to the phenomenon of overextension. Let us suppose that an ESL student has picked up the expression *listen to the music* as a specific exemplar of *listen to*. Kawade (1984a) suggests that L2 students tend to pick up specific exemplars as unanalyzed chunks; hence, the word *music* almost automatically triggers the verb *listen to* to form the chunk *listen to the music*. There is a possibility that students overextend *listen to* to a context like the following:

(10) Do you _____ the music out there? They are having a party or something.

where the verb *hear* is normative. The source of specific exemplars can be traced to the input to which the student is exposed (including the teacher and teaching materials).

Tomoko Takahashi (personal communication) pointed out an interesting case of the Specific Exemplar Condition. In the sentence below both *speak* and *talk* are equally good responses.

(11) Would you _____ more slowly? I don't understand English very well.

However, 86% of 300 Japanese ESL students gave *speak*, and only 6% gave the response *talk*. The word *English* motivates *speak* more strongly than *talk* because the Japanese ESL student tends to have the expression *speak English* as the specific exemplar of *speak*. Thus, the preference of *speak* over *talk* in (11) seems to be related to the Specific Exemplar Condition in a rather interesting way.

How do we know that a student has such and such items as specific exemplars? One possibility is a word-association approach. Tanaka (1983) suggested that in order to make a linguistic analysis from the student's point of view, we must take *the strength of word association* into consideration. For example, given the following:

(12) His voice is so _____ that it hurts my ears.

Japanese ESL students tend to choose *big* if they make incorrect responses. In Takahashi's (1984) study, of the 300 subjects who responded to item (12), 182 (60.7%) made incorrect responses. Of the 182 subjects, 116 (63.7%) chose *big*, and 37 (20.3%) chose *large*. The question is why the Japanese students used *big* much more frequently than *large*. Both *big* and *large*, if given in a null context, are translated into Japanese *ookii*. However, if Japanese students are asked to provide the English equivalent of Japanese *ookii* in a null context, most of them tend to say *big*. Our informal study substantiated this. Thus, we may say that Japanese *ookii* is most strongly associated with English *big* in the Japanese student's mind.

We may extend this word association technique to the study of specific exemplars. We may present the item to be investigated to a large number of students in a null context, as in (13):

(13) WATCH [ ]

The students provide as many noun phrases as they can think of within ten seconds. Data analysis involves calculating the frequency of the responses made by the students. The responses with the highest frequency will be considered to be most strongly associated with the item in question. This procedure seems to work satisfactorily in the case of verbs and possibly adjectives, while we don't know how to investigate specific exemplars with reference to substantive words (nouns) and other part-of-speech words.

Summary and Implications

In this study, we proposed the STH, which predicts that language transfer is both pervasive and persistent. The STH is based on Interlingual Semantic Mapping which has two components: the STE and the SCE. The STE constrains the initial hypothesis the student makes about a new L2 word; the SCE constrains the restructuring process of the initial hypothesis. We also suggested that the STH should be constrained by prototypicality and specific exemplariness in order to account for over- and under-extensions.

Referring back to Figure 4, the domains (e, f) and (x, y) represent overextensions; the domains (c, d) and (r, s) represent underextensions. The overextension in the domain (e, f) is motivated by language transfer; the overextension in (x, y) is motivated by lexical creativity, although we do not know the nature of lexical creativity. The underextension in the domain (c, d) is related to language (non-)transfer, which is motivated in turn by prototypicality. The non-occurrence of transfer in the domain (g, h) is also due to the effect of prototypicality. The underextension in the domain (r, s) is motivated by the Specific Exemplar condition.

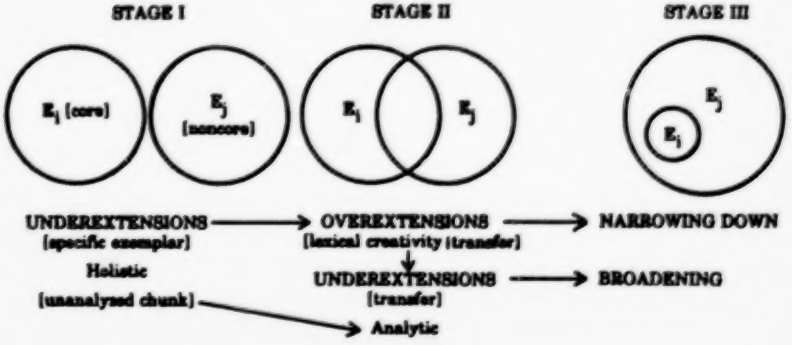
Thus, we have proposed the STH, the SE condition, and the prototype condition that are operating, presumably interactively, in a total process of lexico-semantic development in adult L2 learners.

Finally, we must consider a developmental issue. How are over- and under-extensions related in a developmental sense? In the case of child language development, underextensions tend to occur in the first stages of acquiring lexical items, and overextensions characterize later stages of lexico-semantic development. The child learns to extend lexical items correctly along with experience with exemplars and non-exemplars, and with feedback about past and present decisions about the use of items.

Like children, the adult L2 learners may at first use an item in a limited set of contexts. Underextensions motivated by the specific exemplar condition characterize the initial stages of L2 lexico-semantic development, and underextensions motivated by prototypicality appear in later stages along with L1-related overextensions and lexical creativity. Later on, overextensions will be narrowed down and underextensions broadened until the student's semantic structure of the TL item in question matches the adult native speaker's. With the developmental

process suggested here, we may further speculate that the learner develops a core-noncore relationship of lexical exemplars through a series of restructuring as suggested in Figure 8:

FIGURE 8
A Developmental Process of Lexico-semantics in a Second Language



Initially, the learner picks up core (Ei) and noncore (Ej) exemplars of a lexical item and treats them as if Ei and Ej were separate: In Stage I Ei and Ej are independently learned in application to specific situations. At this stage, the student is not aware of the core-noncore distinction of exemplars. In Stage II the student begins to notice that Ei bears some resemblance to Ej, and that Ei and Ej are somehow related to each other. It is presumably in this stage that the student becomes both adventurous and cautious in his attempt to use Ei and Ej. Perhaps experience with L1-related over-extension errors leads to L1-related underextensions. The rule is: don't transfer what is possible in W1 to the use of W2 when dealing with extended exemplars. The core-noncore relationship of Ei and Ej gradually becomes clear in Stage III, along with the continual process of narrowingdown and broadening.

What is suggested here is an oversimplified model of lexico-semantic development in adult L2 learners. It remains for future research to indicate on empirical grounds how the model should be revised. In particular, future research should suggest the criteria for the learner's decision-making process concerning the coreness of exemplars; it should also suggest what kind of feedback is essential to encouraging the student to restructure his non-normative hypotheses. The former will bring about theoretical implications; the latter, pedagogical ones.

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